EFFICIENCY OF THE IMPAIRED
WORKER

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Rehabilitation Services Series No. 1

Efficiency
of the
Impaired Worker

A Review of Information
On The Experience
Of Employers
Of Handicapped Workers

JUNE 1946

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Foreword

Along with the increased employment of handicapped persons in recent years, many inquiries concerning the employment efficiency of impaired workers have been received by the Office of Vocational Rehabilitation. The past 25 years have provided a sound foundation of experience in restoring the handicapped to employment and an effective demonstration of the handicapped at work. Their remarkably favorable production record establishes the value of vocational rehabilitation for the handicapped. There can be little doubt left in the mind of anyone who reads the documented record of the performance of the handicapped on the job that they are capable of competing with the able-bodied worker when adequately prepared and properly placed.

This bulletin is a résumé of the record of the handicapped in industry. The results answer many questions posed by those concerned with the helping and with the hiring of the disabled. This report was prepared in the Research and Statistics Section, Office of Vocational Rehabilitation.

Michael J. Shortley,
Director.

Efficiency of the Impaired Worker

A great proportion of the disabled may be so termed only to the extent that they are unable to perform certain job functions. They are capable of becoming proficient in many kinds of occupations. The experience of rehabilitation workers, as well as those employers who have given the handicapped an opportunity to demonstrate their ability, establishes these facts beyond question.

During the 1930's, State Rehabilitation Agencies placed thousands of disabled persons in jobs—jobs which were held while millions of able bodied were unemployed. During the recent war years, large numbers of disabled persons obtained work for the first time. Many of their employers had never before hired impaired workers. So efficient was their performance that temporarily modified personnel practices in many instances have become permanent employment policies.

With predictions of considerable unemployment, concern for the employment of the disabled is renewed. Handicapped workers have been marginal workers. This has been, however, more because of the unfamiliarity of employers with their potentialities and the consequent fear of inefficiency, higher accident rate or more absenteeism than because of any proved differences in production or efficiency between the disabled and the able bodied. Whatever the reason, however, the fact remains that with anything less than full employment, the impaired worker is likely to have difficulty in finding employment. To give the handicapped an equal chance, two types of action are vital.

First, the present efforts by State Vocational Rehabilitation Agencies to assist the physically and mentally handicapped through a full-fledged vocational rehabilitation program must be encouraged and expanded. Services such as counseling, training and retraining, physical restoration to remove or reduce the handicap, maintenance if necessary, and ultimately placement in a job which will not aggravate or cause a recurrence of the condition must be made available to all who need them. Cooperation between Federal, State, and local rehabilitation programs as well as private industry is essential.

Second, if the physically handicapped worker is to have an equal chance with the able-bodied worker in the competition for jobs, it must be clearly demonstrated to the employers that the handicapped can perform on many jobs as well or better than the able bodied. In short, the physically handicapped worker adequately prepared and properly placed is not vocationally handicapped. To demonstrate this second point, we have reviewed the body of information concerning the physically handicapped and have included in this bulletin the essential data on the subject.

Sources of information

The most abundant type of data dealing with the performance of the physically handicapped is unsolicited opinion of employers who have had experience with this group. These writings are important because they reflect the opinions of persons upon whom the handicapped must depend for their employment. Data have also been obtained from groups of employers through questionnaires submitted by organizations such as the Bureau of Labor Statistics, the Office of Vocational Rehabilitation, the National Industrial Conference Board, and the Committee for the Care of Jewish Tuberculous.

The second type of information is based on study schedules which contain specific questions relating to a number of individual handicapped workers. These studies generally relate only to the performance of the handicapped workers in selected plants and the only comparisons possible are with available statistics for the same plant or with the working population at large. Inasmuch as the characteristics of the handicapped such as age, sex, length of experience, and type of job may vary considerably from those of the other employees in each plant, or from the population at large, such comparisons do not lend themselves to objective conclusions.

Several studies have been made with matched groups. The first and most widely cited was made by The Western Electric Company in 1931, (*8*).[1] This company hired a group of 652 handicapped and an equal number of unimpaired persons on the same day, in the same type of job and in the same department, and studied the 2 groups for absenteeism, accident rate, and other factors. Another study was conducted by the United States Civil Service Commission, (*10*). Two thousand, eight hundred and fifty-eight seriously impaired workers were matched with 5,523 unimpaired workers in 43 plants operated by the War and Navy departments for aircraft, ordnance, shipbuilding and repair, etc. In this study, from 1 to 3 able-bodied persons were selected at random and matched with physically impaired persons for age, sex, type of job, wages, and identity of supervision and studied for absenteeism, efficiency, and turn-over. A third and most recent of these studies was made by Tobias Wagner (*27*), as a doctorial thesis at New York University. In this study, 300 orthopedically handicapped persons in 23 light, medium, and heavy industrial plants were paired with 300 able-bodied workers for age, sex, length of time, and previous experience on the same job. On studies such as these, it is possible to draw conclusions as to the relative efficiency of the handicapped and nonhandicapped. A study on 4,000 seriously impaired workers and a control group of about 8,000 unimpaired workers is presently being undertaken by the Bureau of Labor Statistics to provide further information as to relative work performance.

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[1] The numbers in parentheses refer to bibliography at the end of the text.

The survey of existing studies indicated the great need for further research in this field. The study of job achievements of persons with disabilities such as epilepsy or cerebral palsy has been almost wholly neglected. Such studies are badly needed inasmuch as discrimination against such groups is particularly severe because of the nature of the handicap. Moreover, few studies are based on comparative studies of control groups. Such studies in which the disabled and nondisabled are matched for selected factors are the most desirable.

Types of handicapped persons employed

Some employers such as George Barr and Company recruit their employees almost wholly from the disabled group, (*12*) (*17*). Of the 142 employees in this firm 127 are deaf, blind, orthopedically disabled, epileptic, cerebral-palsied, arthritic, or mentally deficient. Ninety-five percent of the employees of the Minneapolis Artificial Limb Company, (*24*), are orthopedically disabled.

Most companies, however, have found it more expedient to absorb a proportionate number of handicapped in suitable jobs along with the nonhandicapped. A number of companies have maintained a policy of hiring persons with certain types of disability. For example, Marshall Field, (*22*), has for some time been giving special attention to the employment of persons with heart impairment as has Eastman Kodak Company, (*6*). Both companies have expressed considerable satisfaction with the results of their experience. Likewise the Lockheed Aircraft Company, (*21*), employed a large number of physically handicapped among whom are a considerable number of persons with cardiac disabilities. Over a period of years the deaf have been employed in increasing numbers by Goodyear Tire and Rubber Company, (*5*), until at the present time almost 800 deaf workers are employed. Among the many employers of the blind cited in the study made by the National Society for the Blind, (*14*), are North American Aviation, Boeing Airplane Company, Bates Manufacturing Company, Otis Elevator Company, and Radio Corporation of America. A survey made by the Committee for Care of Jewish Tuberculous, (*11*), dealt with 203 companies all of which made it a point to reemploy their tuberculous employees. Hochhauser, who conducted this study, mentions that those employers who have planned for the employment of the tuberculous have had good results.

The Ford Motor Company (*9*), has made it a practice to employ handicapped workers in its plants in proportion to their number in the population within the area surrounding the plant. As of October 1944, this company employed 11,300 handicapped workers. The River Rouge plant alone employs among others 1,208 blind, 111 deaf mutes, 135 epileptics, 139 persons with spinal curvatures, 322 with organic heart ailments and 622 with 1 or 2 deformed or missing extremities. Caterpillar Tractor Company (*26*), employs persons with severe disabilities such as loss or deformity of 1 or both legs, loss of 1 or both eyes, loss of speech or hearing, and persons with arrested tuberculosis. The Walter Kidde Company (*23*), a fire extinguisher manufacturing company, hires some severely handicapped, as for example, a drill press operator who is blind, deaf, and mute. Western Electric Company hired a considerable number of visually and orthopedically handicapped, and the United States Civil Service Commission during the recent war hired a number of handicapped persons with orthopedic, visual, hearing, or tuberculous disabilities.

Types of jobs given to impaired workers

Employers who want to give the handicapped a trial are interested in knowing what jobs they can perform. It has been found that practically every job can be performed by some handicapped person. Studies made by the Office of Vocational Rehabilitation indicate a wide variety of jobs. The range of jobs held by persons with varying disabilities is illustrated by the following examples. Amputees are employed as shoemakers, farmers, stock clerks and teachers. Blind are employed as drill press operators, sales clerks, and film inspectors. Persons with arrested tuberculosis are employed as accountants, bakers, watchmakers, and laboratory technicians. Persons with cerebral palsy are employed as leather workers, mechanics, and general office workers. Epileptics are employed as draftsmen, electricians, and farmhands. Persons who are hard of hearing are employed as carpenters, mechanics, and stenographers.

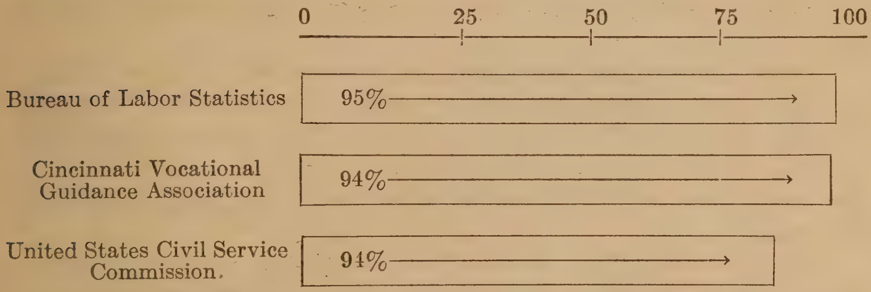
The variety of jobs that can be filled is illustrated in a study made by Poole and Bent in Lockheed Aircraft showing that cardiacs were placed in 99 out of 353 job classifications. This was made possible by the complete job breakdown program undertaken by the plant supervisor together with the cooperation of the medical department. Each process was subdivided so fully that it included a minimum number of different types of operations. Another study made by Anderson (*4*), covered 653 different types of jobs held by the orthopedically handicapped. The Cincinnati Occupational Research Committee (*3*), found 589 handicapped with visual, auditory, orthopedic, and cardiac disabilities were employed in 193 different types of jobs.

Efficiency evaluated

Although few studies have actually measured relative efficiency of handicapped and nonhandicapped workers, there are innumerable testimonials to the efficiency of the handicapped as compared to that of the able bodied. Companies such as Caterpillar Tractor, Walter Kidde and Company, Consolidated Vultee, the Minneapolis Honeywell Regulator Company, and others indicate that the production rate of the handicapped is as good or better than that of the able bodied.

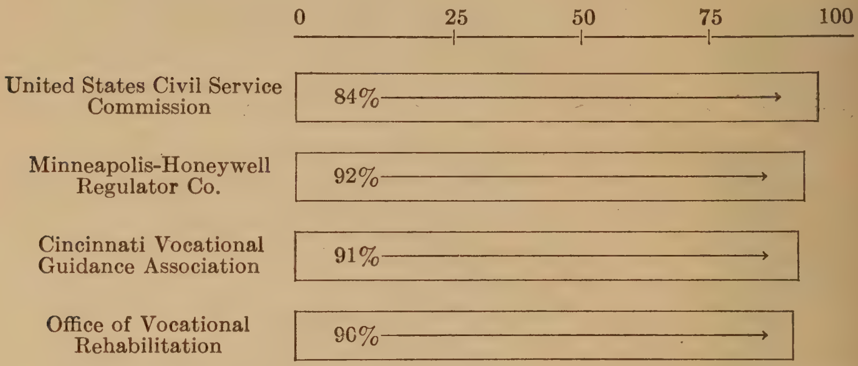
Questionnaires relative to the production efficiency of handicapped persons were sent out by the Office of Vocational Rehabilitation (*1*), and the Bureau of Labor Statistics (*25*), to groups of employers, numbering 100 and 300 respectively. About two-thirds of the employers in the study made by the Office of Vocational Rehabilitation said that production efficiency of handicapped workers was equal to that of the able bodied, and about one-fourth said that the productivity of the former was even better than that of the latter.

FIGURE 1.—*Percentage of Physically Handicapped Workers as Good as or Better Than Unimpaired Workers in Terms of Quality of Production.*



In the study made by the Bureau of Labor Statistics of the 300 employers in manufacturing establishments, 95 percent said the performance of the handicapped was as good as or better than the able bodied. In a study made by the Minneapolis Vocational Guidance Association, (19), in which a number of employers were also polled on specific questions, 92 percent of handicapped employees were shown to have production records at least equal to those of the nonhandicapped. Nineteen percent of these had better records. A consensus of employers and foremen interviewed indicated that the determination to succeed on the job, characteristic of the physically handicapped, resulted in more conscientious attitudes. In the Civil Service Commission Study of the disabled and nondisabled employees quantity and quality of performance were compared. Both quality and quantity of work of the handicapped were as good or better than the able bodied. This was substantiated by the efficiency ratings of the two groups.

FIGURE 2.—*Percentage of Physically Handicapped Workers as Good as or Better Than Unimpaired Workers in Terms of Quantity of Production.*



Some determining factors in efficiency comparisons on which information is available are ability to stand the strain of a working day, the length of time necessary to learn a job, and the number of reexaminations or transfers because of failure or breakdown on the jobs.

Two companies, the Barr Company and the Minneapolis Artificial Limb Company, whose employment policies are to hire a large proportion of physically handicapped, state that handicapped people are eager workers capable of maintaining their efforts when the job fits them, over as long or longer periods of time than able bodied workers.

A study made by the Minneapolis Vocational Guidance Association as well as a study made by the Minneapolis Honeywell Regulator Company, (*13*), indicate that 92 percent and 95 percent, respectively, of the handicapped need no more supervision than the able bodied. In a matched study made on 300 orthopedically handicapped, however, Wagner points out that during the first year on the job handicapped workers are usually less efficient than other workers, and when disabled persons are placed in jobs where they have no previous experience they are likewise less efficient. On the other hand, he adds that after a year's experience, if they are properly placed, disabled workers eventually become superior to able bodied workers.

The studies made by Consolidated Vultee, (*16*) (*7*), brought out that nondisabled workers required more reexaminations and transfers because of breakdown or failure on the job than did disabled persons who were selectively placed. In connection with this, a study made in 1935 in the California Vocational Rehabilitation Agency, (*2*), demonstrated that more than 75 percent of the handicapped who were surveyed had an opportunity for promotion.

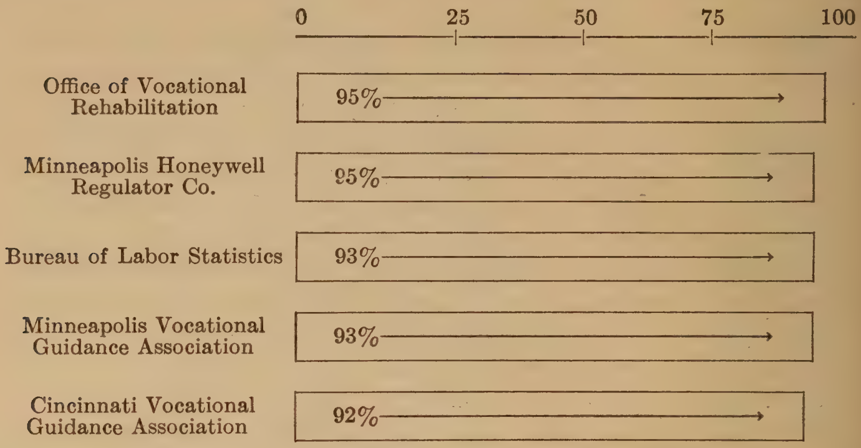
Good wages is one of the more objective tests of productive efficiency in an economy where employees are seldom paid more than they are worth to their employer. Caterpillar Tractor Company, Civil Service Commission, the Minneapolis Honeywell Regulator Company, Lockheed, and Western Electric, (*8*), have indicated that the handicapped receive wages equal or nearly equal to the nonhandicapped. The Ford Company has stated that the handicapped give full value for wages. In several follow-up studies on handicapped persons made by the Office of Vocational Rehabilitation a few years ago, they were found to have increased their wages during the period since original placement.

Absenteeism

During the war, stress was laid on the absentee record of the employees because of the necessity of getting maximum production. Absenteeism records are still one of the most important components of successful management. Walter Kidde Company, the George Barr Chemical Company, the Minneapolis Artificial Limb Company, and the Consolidated Vultee Aircraft Corporation all reported that the handicapped had fewer absences than other workers. In a survey made by the Committee for the Care of Jewish Tuberculous, less absenteeism is reported for tuberculous individuals than for all employees in the plants surveyed. In the Minneapolis Honeywell Regulator Company, 5 percent of the disabled studied were absent more than the average for the plant. One percent of the disabled were tardy more than the plant average.

The largest number of studies showed no appreciable difference between absenteeism of handicapped and nonhandicapped workers. In the Lockheed Aircraft study, individuals with cardiac disabilities showed no more lost time than other employees. In the study made by Cincinnati Occupational Research Association, handicapped workers were reported as losing around 6 man-hours per month which did not vary significantly from the 5 to 8 man-hours lost per month for all causes by industrial employees reported to the War Manpower Commission for the period June 1943–April 1944. Similarly, the survey made by the Bureau of Labor Statistics showed 93 percent of the employers believed handicapped had equal or better absenteeism records while of the 97 employers reporting to the Office of Vocational Rehabilitation, 95 percent believed the handicapped had equal or better than average absenteeism records.

FIGURE 3.—*Percentage of Physically Handicapped Workers as Good as or Better Than Unimpaired Workers in Terms of Attendance.*



In Western Electric Company, 10 percent more disabled than able bodied were absent due to personal reasons although even here it is reported that 7 percent fewer handicapped were absent because of illness. The fact that absenteeism, when it does occur, does not arise from the disability, is emphasized by the Minneapolis Artificial Limb Company which states that among their handicapped, absenteeism arising from disability is almost unknown. In the Lockheed study on cardiacs too, the proportionate number of cardiacs absent because of sickness was appreciably lower than the number of nonhandicapped workers. One explanation of the small amount of absenteeism due to sickness among the handicapped may be that the handicapped take better care of themselves.

Accidents

One of the biggest hurdles for the handicapped is the belief on the part of many employers who have not yet given them a trial that they are more prone to accidents. In the study made by the Office of Vocational Rehabilitation 98 percent of the employers said the handicapped had either the same or lower accident rate than able-bodied. In the questionnaire sent out by the Minneapolis Vocational Guidance Association, 96 percent of the handicapped had lost no time due to accidents. The Minneapolis Artifical Limb Company, in which 95 percent of the employees are handicapped, has not had a major accident in years and for the past 3 consecutive years has been awarded plaques in recognition of safety by one of the largest liability companies in the Northwest. In the Warner Robins Air Training Command, (20), which employed a number of handcapped employees, the frequency rate of injury for disabled employees was found to be somewhat lower than for all employees. In the Cincinnati Occupational Research study, the number of lost time accidents for handicapped was 11 per million man-hours compared to 18 for all employees in Hamilton County. In the study of matched disabled and able bodied made by Wagner, the accident frequency rate was lower for the disabled than for the nondisabled employees, although the severity rate was slightly higher.

In the Lockheed study as well as in the study made by the Civil Service Commission, the handicapped had a somewhat higher rate of accidents than the nondisabled, although in both cases the severity rate was lower than for the unimpaired. In the Lockheed study, the higher accident rate is explained by the fact that accident rates during the learning period are almost twice the company's average, and that the average length of employment of the cardiacs was within the usual learning time period. Therefore, their accident frequency rate, 14 accidents per million man-hours for the handicapped as compared with 7 for the plant as a whole, is not significant. In the United States Civil Service Commission study, likewise, the nondisabled had a longer job experience than the disabled prior to the study. The total accident rate was also considerably affected by the type of workers, type of industry, and type of handicaps where accident rates were excessive. The accident rate was high per individual with shoulder or hip injury, with finger amputations, and auditory defects, and low for those with arm or leg amputations, visual defects and with arrested tuberculosis.

The most convincing argument for employers as to the low accident rate of the physically handicapped comes from the organization that has to pay for the accidents. The Association of Casualty and Surety Executives in February 1944 stated that "it is the policy and practice of member companies of this association not to advise employers against employment of disabled persons. The initial rate for workmen's compensation insurance is governed by the industrial classification involved. The physical defects of such workers are not considered in the formulae for determining that rate, and no higher rate is charged because of employment of physically disabled persons. Nor is such employment prohibited in any way by the terms of workmen's compensation insurance policies. It is true that experience, good or bad, will ultimately be reflected in the cost of insurance."

The Association has expressed itself as favoring second injury funds laws in all States since such laws minimize 1 of the major objections to employment of disabled workers.[2] A number of States have second injury laws. Of the 34,000 injuries recorded during 1938 in Massachusetts, (*15*) (*18*), only 3 compensable second injuries were sustained. This is a second-injury rate of less than 1 ten-thousandths of 1 percent. New York State in the 12 years prior to 1943 had 1 second-injury case per 11,170 compensated cases. Wisconsin in 20 years experience under its second-injury law had only 56 cases. The New Jersey Commission for the Blind reports no industrial accident suffered by the blind during the 47 years of the Commission's history.

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[2] In the words of Verna A. Zimmer, Director, Division of Labor Standards, (28), "the simplest form of second-injury fund provision states that when an employee who has previously lost a hand, arm, foot, leg, or eye loses another member, and as a result is totally or almost totally disabled by the combined injuries, the employer shall pay only for the partial disability that would have been caused by the last injury considered by itself.

Turn-over

The record of the handicapped compared to the able-bodied with respect to their production, absenteeism, and accident rates seems a sufficient reason for giving them a fair trial. On the question of turn-over or job stability, however, there is virtual unanimity that the handicapped are superior to the nondisabled.

In terms of actual years served, the Minneapolis Artificial Limb Company stated that their handicapped employees have been with them on an average of 15 years. In a study of 243 deaf employees it was found that the great majority had been with the same employer for more than 5 years, and 23 had remained with the same company for more than 20 years. In the Bureau of Labor Statistics survey, 60 percent of employers said that the labor turn-over of handicapped was less than the able-bodied while in the Office of Vocational Rehabilitation study over 80 percent took this position. In Warner Robins Air Training Command, the handicapped constituted about 15 percent of all employees in the plant but only 6 percent of all separations. In the study made by the Civil Service Commission, only 5 percent of the disabled compared to 53 percent of the able-bodied separated from employment.

The Western Electric Company study showed that the turn-over of handicapped employees was appreciably less than the nonhandicapped. It was concluded in this study that although costs of careful placement might be greater in hiring handicapped, such costs were more than offset by the savings in terms of lower turn-over rate.

Special considerations

The belief that the handicapped require special consideration or modification of the job to suit their needs, all of which involve addi-

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The employee, however, will be paid compensation for the disability resulting from the combined injuries. The difference between the cost, for example, of the loss of a second arm or leg, and the cost of compensation for permanent total disability, will be paid out of the second-injury fund.

The second-injury funds are usually supported by a charge or award made against employers when the worker who has been killed does not leave any dependents * * * in some States the second-injury fund is supported by a levy of a small percentage of the compensation allowable for permanent partial disabilities, that is, the disability resulting, for example, from the loss of one member—an eye, hand, foot, or leg * * * (or) these two arrangements are combined * * * (or) insurance carriers may be taxed a certain percentage of their payments."

tional cost is not infrequently an obstacle to their employment. The evidence indicates that such special considerations are unnecessary. In the two Minneapolis studies it was stated that 98 percent of the handicapped do not expect favors. The same studies showed it was unnecessary to modify the job in any way whatsoever for 85 to 90 percent of handicapped workers. The Ford Motor Company has not found it necessary to make any special allowances nor has the Minneapolis Artificial Limb Company or the Civil Service Commission. The Caterpillar Tractor Company recognizes that the handicapped are just like other workers and require no special consideration. They also recognize, however, their corollary obligation to give the handicapped the same consideration as other employees in being retained in the job in any cut-back in employment.

Conclusions

One study after another indicates that the handicapped are dependable, regular in attendance, careful in observance of safety regulations, loyal, and satisfactory in the amount and type of work they turn out. The author of one of the best studies states that the most important factor in insuring the work efficiency of the disabled is proper placement. With such placement however, no difference exists in the work efficiency between able-bodied and disabled workers when they are properly placed. There are fair, good, and excellent workers in both groups and the distribution of these ranks is normal in each.

The quality and quantity of their work compares favorably with that of the unimpaired. Their attendance and accident records are likewise on a par with that of their fellow workers. They stay on the job considerably longer than the average able bodied.

Special skill, it is true, is needed in preparing them for jobs and in selective placement. For the most part, however, these services are provided to the handicapped by the Federal and State Governments and are no drain upon individual employers. Even for those employers, however, who have specialized divisions for the training and placement of handicapped, the costs incurred are more than outweighed by the extremely low separation rate of this type of employee.

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